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None

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**(54) A fountain brush pen provided with a nest brush seat and concealed vents**

(57) A fountain brush pen comprises a nest brush seat (1), a pen stem (2), a brush cap (3) and a plurality of concealed vents. Two groups of code strips are provided on the joint between the stem member and the brush seat to indicate alignment or non-alignment between an ink inlet (113) and an ink outlet (217) of the brush seat. The upper end of the pen stem (2) is provided with a large vent (213) and a small vent (212), which are controlled by a cap (23) so as to control the flow speed and volume of an ink dispersed to the brush applicator (13). The brush cap (3) is provided with a smaller rotary cap (34) having a vent (35). When the brush cap (13) is turned to have the cap vent (33) aligned with the vent (35) of the small cap, the brush portion (13) inside the brush cap may be ventilated to prevent fungi forming on the brush. When the brush cap (3) is turned to have the cap vent (33) not aligned with the vent of the small cap (35), ink in the brush portion is contained therein without being dried up.

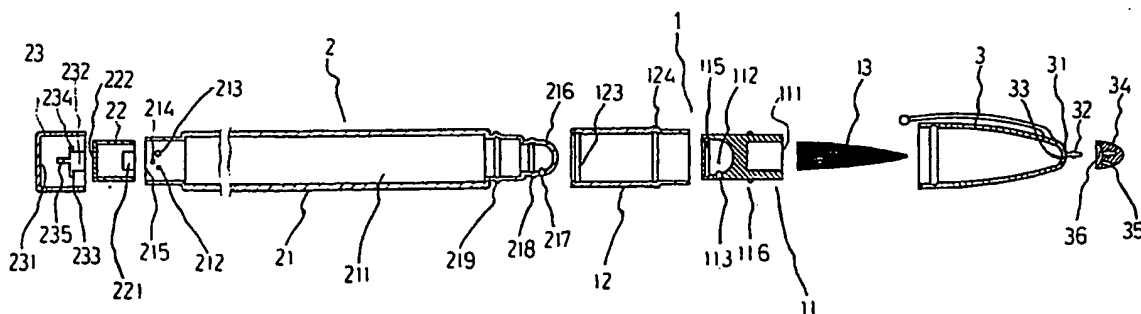


FIG. 1

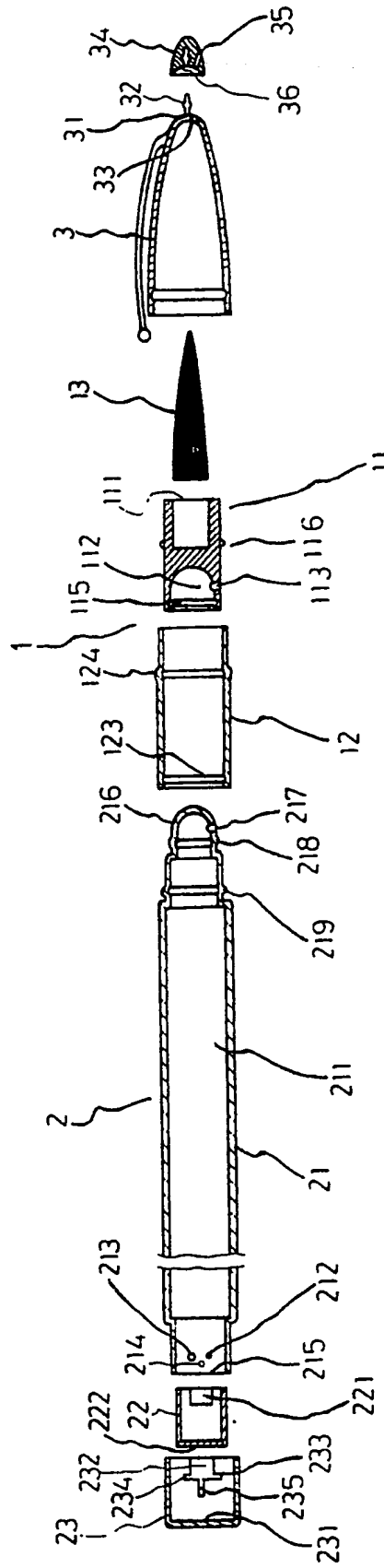


FIG. 1



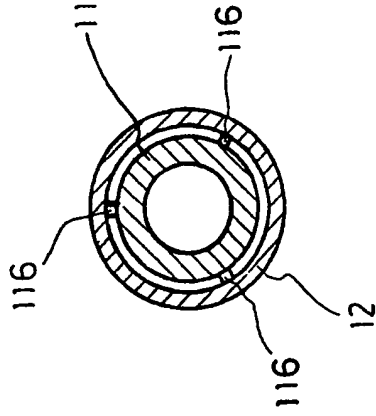


FIG. 6

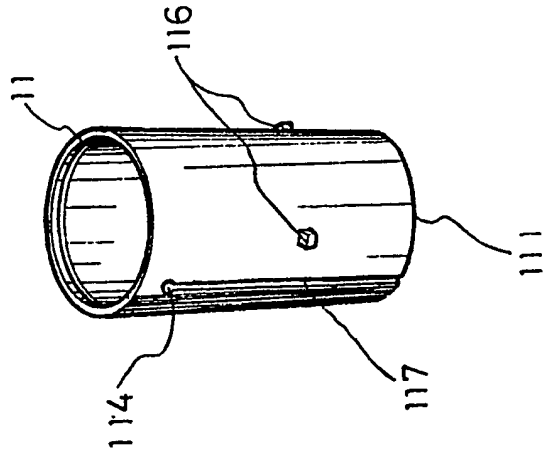


FIG. 3

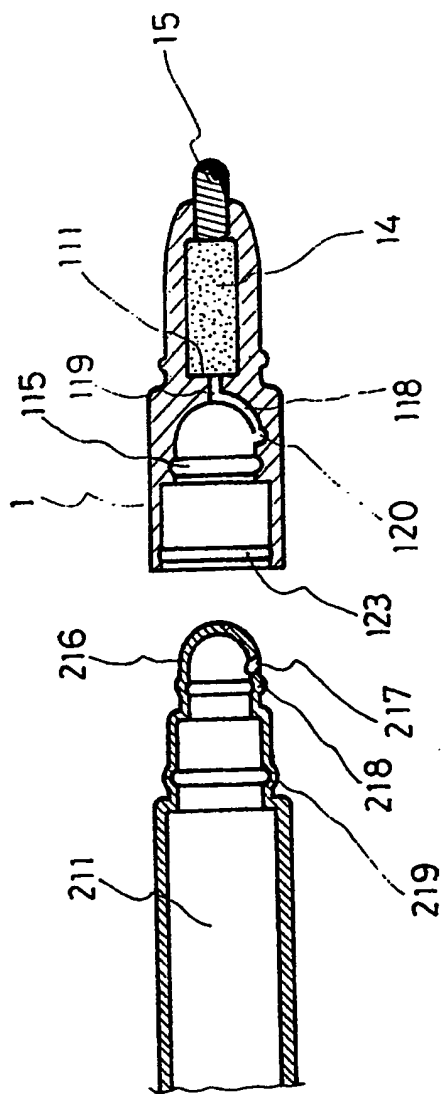


FIG. 4

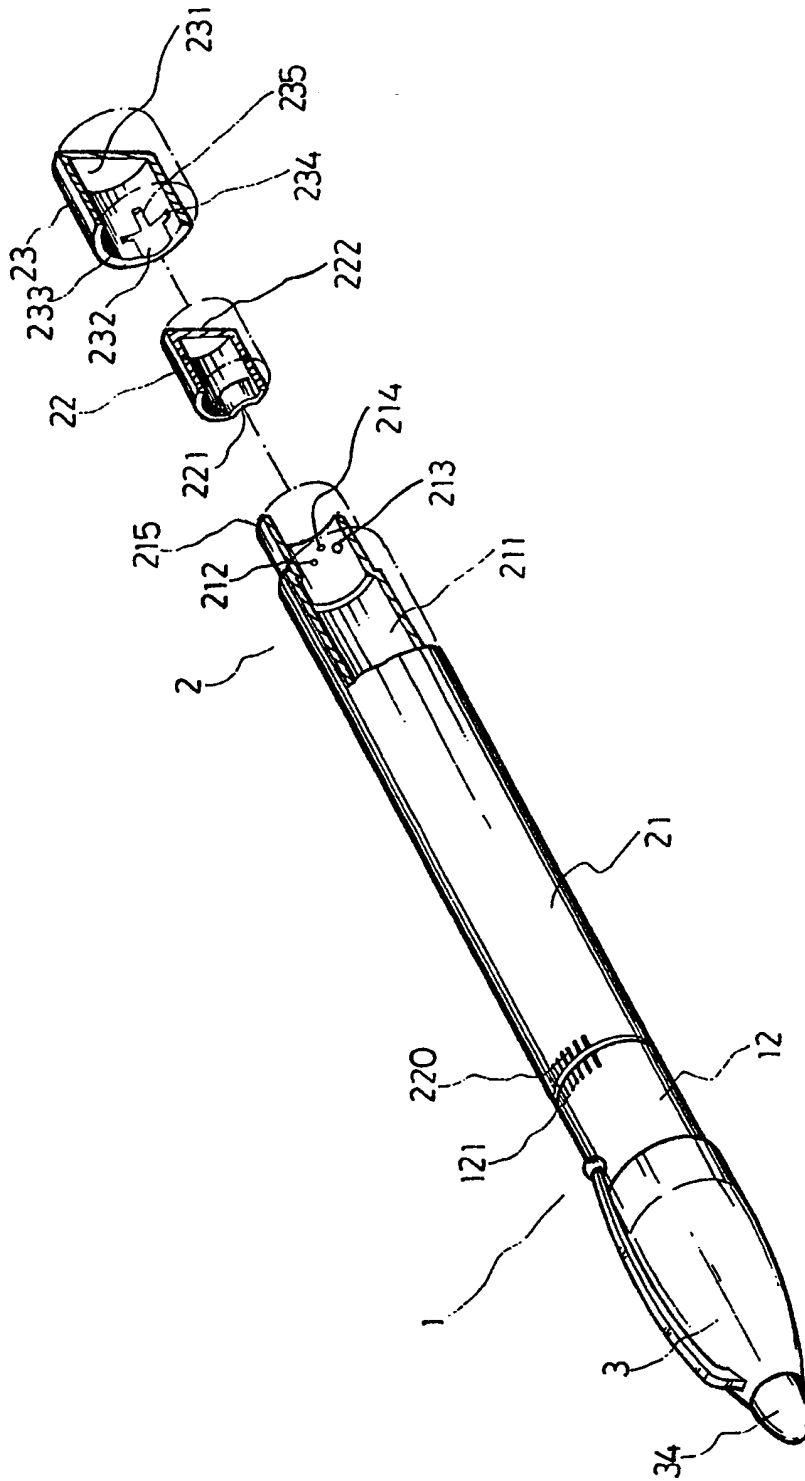


FIG. 5



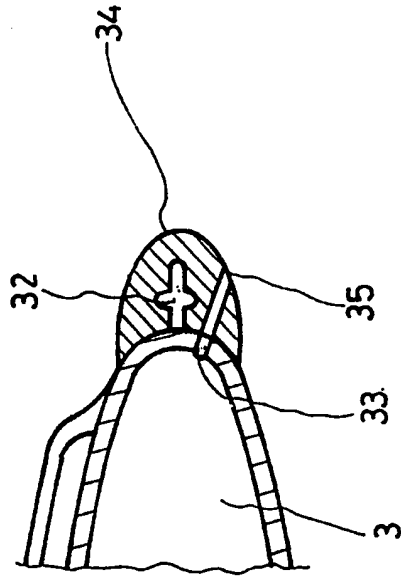


FIG. 9

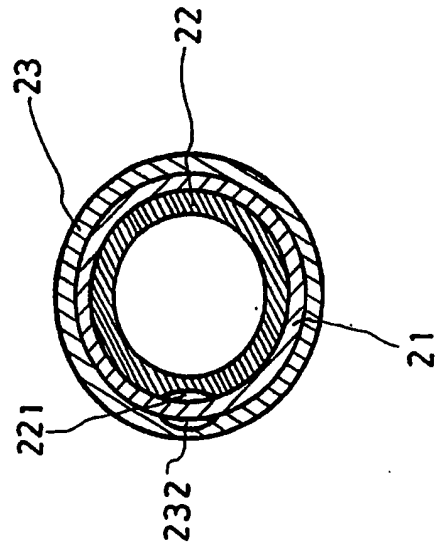


FIG. 8



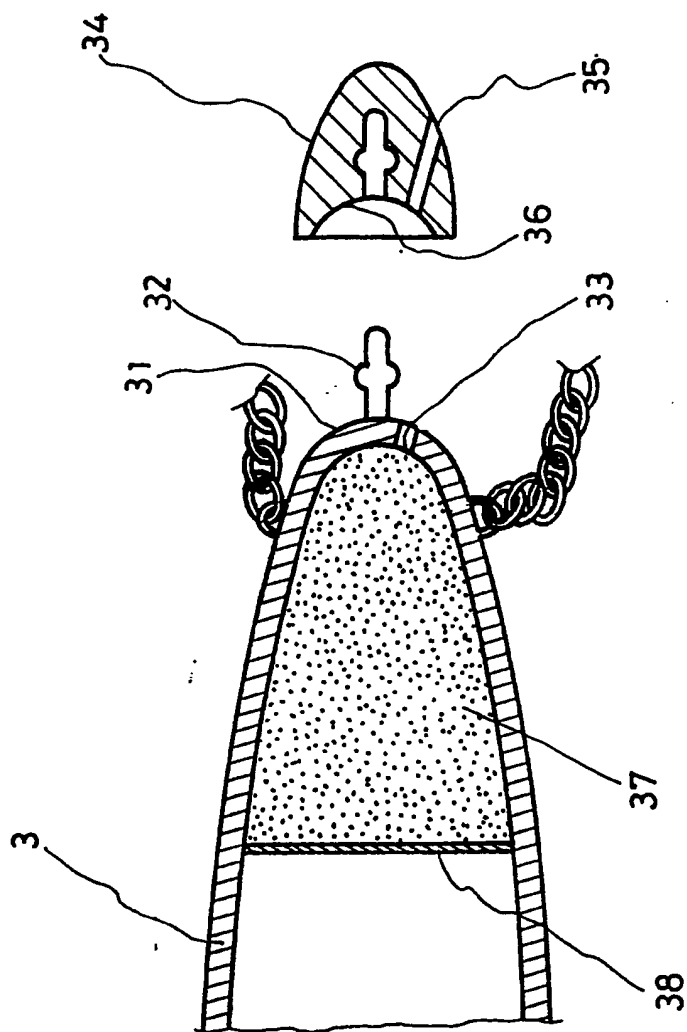


FIG. 10

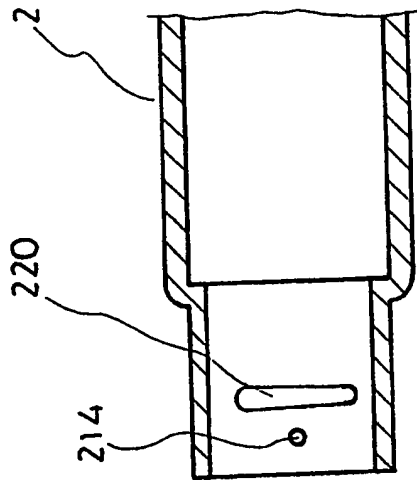


FIG. 11

A Fountain Brush Pen With A Nest Brush Seat and  
Concealed Vents

This invention relates to a fountain brush pen.  
5 particularly to pen with a nest brush seat and concealed  
vents.

The conventional fountain pen is usually used for  
writing or painting. As shown in U.S. Patent NO.1,413,827,  
its cap can be opened to show a round vent on the stem same  
10 as that of a conventional bulloopen then, turn the knurled  
knob to drive the valve behind the pen tip for releasing an  
ink. In another U.S. Patent No.4,789,261, a tail plug on the  
rear end of the pen stem is to be pushed to compress an ink  
in the ink reservoir to flow downwards into the brush  
15 portion. In French Patent No.553845, a plug with a single  
conventional vent and a pen stem with a single conventional  
vent are used to cause an ink to flow, but they are unable to  
control the flowing speed and volume of the ink. However, the  
aforesaid patents are deemed to the conventional pen of the  
20 kind, i.e., the pen tip and the sponge inside the pen stem  
are the same in color; they can not be used to dip in  
different inks for painting. If the sponge inside the pen  
stem contains more ink or insufficient ink, the pen would not  
work properly. If the pen tip is make of animal hairs, the  
25 hair portion would go to decay in case of being covered with

a cap for a long time; If the pen is without a cap, it would be inconvenient for a user to carry the pen.

5 The prime feature of the present invention is the brush seat, i.e., the joint parts between brush seat and the pen stem are furnished with a group of corresponding code strips. When the large vent and the small vent on the rear end of the pen stem are opened, an color ink in the pen stem would flow out through an ink outlet, an ink inlet of a semi-spherical cap of the inner member of the brush seat, a groove  
10 in the space between the inner member and the outer member, and finally flow to and around the brush portion for writing.

Another feature of the present invention is the pen stem, in which the cap can be turned laterally or pulled longitndinally so as to open the large and small vents;  
15 simultaneously, the ink outlet should be opened to control the flowing speed and volume of the ink. If the large and small vents, and the ink outlet are closed, the ink in the pen stem wauld be unable to flow out. The pen tip may be washed with water to dip into other color ink for writing.

20 Still another feature of the present invention is the brush cap, in which the vent of the small cap can be in alignment with the cap vent of the brush cap upon the small cap being turned; in that case, the brush portion made of animal hairs can be dried up as a result of ventilation, and  
25 the brush portion would not become decayed. If the two vents

are not in alignment each other, the ink contained in the brush portion would not be dried up. the pen can be used to write later, and can be carried for a given period of time conveniently.

5           An embodiment of this invention is described by way example with reference to the drawings, in which.

FIG.1 is a disassembled view of an embodiment according to the present invention.

FIG.2 is a sectional view of the present invention.

10           FIG.3 is a perspective view of the inner member of the brush seat according to the present invention.

FIG.4 is a sectional view of another embodiment according to the present invention.

15           FIG.5 is a partial sectional view of the present invention.

FIG.6 is a trans verse sectional view of the portion between the inner member and outer member of the brush seat according to the present invention.

20           FIG.7 is an enlarged sectional view of the connection part between the pen stem and the brush seat of the present invention.

FIG.8 is a transverse sectional view of the assembled portion among the stem member, the plug and the cap according to the present invention.

25           FIG.9 is an enlarged view of the brush cap structure

according to the present invention.

FIG.10 is another embodiment of the brush cap according to the present invention.

FIG.11 is another embodiment of the vent on the stem member according to the present invention.

Referring FIGs.1 and 2, the present invention comprises a pen stem 2, a brush seat 1, and a brush cap 3; the brush seat 1 includes an inner member 11, an outer member 12, and a brush portion 13. The outer member 12 is a hollow cylinder, of which the outer surface to be connected with the pen stem 2 has code strips 121; the mid-port of the outer member 12 has a salient ring 124 to be mated with a ring-shaped groove in the brush cap 3. The inside surface of the outer member 12 to be connected with the pen stem 2 has a groove 123 to be mated with a salient ring 219 of the pen stem 2. The opening 111 of the inner member 11 is fixedly mounted with a brush portion 13, while the rear inner end of the inner member 11 is formed into a semi-spherical cap 112. FIG.7 is an enlarged sectional view of the connection part between the pen stem and the brush seat; it shows that the semi-spherical cap 112 is closely mated with a semi-spherical stud 216. The semi-spherical cap 112 has an ink inlet 113, which is in communication with the inner and outer surfaces of the cap 112. the outer surface is furnished with a groove 117 (as shown in FIG.3), extending to the opening 111. he

inner surface of the rear end of the cap 112 has a groove 115 in parallel with the rear opening of the cap 112 so as to mate with a salient ring 218 on the ball-shaped stud 216. The outer member 12 of the brush seat is mounted over the inner member 11, but they are spaced with a plurality of spacing struts 116 as shown in FIG.6 so as to provide a narrow passage for ink to flow downwards.

The pen stem 2 includes a stem member 21, a plug 22, and a cap 23. The stem member 21 is a hollow cylinder to be used as an ink reservoir 211; the rear end of the stem member is provided with a small vent 212, a large vent 213 and a stud 214 (as shown in FIG.5). The rear opening of the stem member 21 is mounted with a plug 22, of which one side is furnished with an outer recess 221. A cap 23 is mounted over the plug and the stem member 21. The top portions of the cap 23 and the plug 22 are fixedly attached together (as shown in FIG.8, a sectional view thereof ) so as to have them rotated simultaneously. The inner surface of the cap 23 and the outer surface of the 23 and plug 22 have an inner recess 232 and an outer recess 221 respectively and oppositely. The inner recess 232 has a left horizontal groove 233 for receiving the stud 214 on the stem member 21, a right horizontal groove 234, and a longitudinal groove 235. The front end of the stem member 21 has a hollow semispherical stud 216, which has an ink outlet 217, being opposite to the ink inlet 113 in the

semi-spherical cap 112 of the inner member 11. A salient ring 218 and a salient ring 219 on the rear part of the semi-spherical stud 216 can be retained inside the brush seat 1. The outer surface of the front and of the stem member 21 is provided with a plurality of salient code strips 220, which are opposite to the code strips on the brush seat 1.

FIG.9 is an enlarged view of a brush cap according to the present invention. The top outer surface 31 of the brush cap 3 has a snap stud 32; beside the snap stud, there is a cap vent 33. the snap stud 32 is mounted with a small cap 34 made of transparent material, and the small cap 34 is rotatably mounted on the snap stud 32. the bottom 36 of the small cap 34 can be closely in contact with the top outer surface 31 of the brush cap 3. One side of the small cap 34 is provide with a vent 35, which can be the same as in size or larger than the cap vent 33. Both vents 33 and 35 are located on the same diameter around the snap stud 32. whenever the two vents 33 and 35 are in alignment each other, air would flow into the brush cap 3, otherwise, the vents will be closed.

To assemble the brush according to the present invention, the salient rings 218 and 219 of the stem member 21 are to be mated with the groove 115 of the inner member 11 and the groove 123 of the outer member 12 respectively so as to assemble the pen stem 2 and the brush seat 1 together as



one piece; then, rotate the either the brush seat 1 or the penstem 2 until the code strips 121 and 220 on the joint part being in alignment correspondingly; in that case, the ink outlet 217 of the semi-spherical stud 216 and the ink inlet 113 of the inner member 11 will be in communication with each other so as to let ink in the ink reservoir 211 flow downwards; in case of the code strips 121 or 220 being stated to a non-alignment position, the ink inlet 113 and the ink outlet 217 will not be in communication with each other, and the ink in the ink reservoir 211 is unable to flow out. When the cap 23 and the plug 22 are mounted on the stem member 21 tightly, the stud 214 above the two vents 212 and 213 is set in a longitudinal groove 235 of the inner recess 232 of the cap 23; in that case, the atmosphere outside the pen stem 2 is unable to flow into the ink reservoir 211; simultaneously, if the code strips on the stem member 21 and on the brush seat 1 are set in non-alignuent position by rotating either one of the stem member 21 or the brush seat 1, the ink in the ink reservoir 211 mill be closely sealed therein. Whenever the cap 23 is pulled outwards slightly, the bents 212 and 213 will be set in alignmment with the inner recess 232 of the cap 23; the atmosphere can flow into the ink reservoir 211 through the vents 212 and 213, the outer recess 221 of the plug 22; in that case, if the code strips 121 and 220 on the brush seat 1 and the pen stem 2 are set in alignment each

other, the ink outlet 217 of the stem member 21 and the ink inlet 113 of the inner member 11 will also be set in alignment each other, and therefore the ink in the ink reservoir 211 can flow out through the ink inlet 113 and the groove 117 on the inner member 11 continuously to the brush portion 13; in this case, a maximum volume of ink will flow out in a fast speed.

If the cap 23 is further pulled out and rotated counter-clockwise, the stud 214 on the stem member 21 will be retained in the right side of the inner recess 232 to close the large vent 213, i.e., only the small vent 212, the inner recess 232 and the outer recess 221 are in alignment; in that case, if the code strips 121 and 220 on the brush seat 1 and the pen stem 2 are set in alignment each other, a smaller volume of ink can flow out of the ink reservoir 211. If the stud 214 in the inner recess 232 is rotated clockwise until the stud 214 being retained in the left side of the inner recess 232, only the large vent 213 is opened, and a mid volume of ink will flow to the brush portion 13; in other words, the brush pen according to the present invention can provide three different flowing volumns of ink in real use.

In fact, the large vent 213 and the small vent 212 on the stem member 21 may be replaced with a slot vent 220 (as shown in FIG.11). the ink outlet 217 of the pen stem 2 and the ink inlet 113 of the inner member 11 may also be changed

to two slot vents respectively; in such case, the flowing volume of the ink may be controlled by spiral rotation of the members related.

FIG.4 is a sectional view of another embodiment according to the present invention, in which the ink inlet 113 of the inner member 11 in the brush seat 1 is replaced with a recess hole 120, but not a through hole. the recess hole 120 is in communication with a hole 119 at the bottom of the semi-spherical cap 112 by means of a groove 118, and with a nylon sponge 14, which is connected with a pen tip 15 made of fiber. An ink can flow from the ink reservoir 211 to the pen tip or a ball pen tip through the ink outlet 217, the recess hole 120, the groove 118 and the nylon sponge 14. When the ink in the nylon sponge 14 is used up, the ink in the pen stem would flow to the nylon sponge continuously.

Referring to FIG.10, the brush portion 13 is a pen tip 15 made of fiber instent of animal hair. The brush cap 3 may be a longer member with a nyeon sponge 37 mounted inside the upper part thereof; the nyeon sponge 37 is used for storing a fluid which is volatile. The other end of the nylon sponge is sealed with a partition beard 38 to separate the brush cap into two isolated spaces. A perfume may be injected, through cap vent 33, into the nylon sponge 37, and then a small cap 34 is mounted over the top outer surface 31 with the cap vent 33 and the vent 35 being set in a non-

alignment condition so as to close the cap vent 33. In time of using the brush pen, turn the small cap 34 to align the vents 33 and 35 each other, and then the perfume will be vaporized into the air to provide a pleasant smelling effect to a user.

5

## CLAIMS

1. A fountain brush pen with a nest brush seat and concealed vents comprising:

5 a brush seat including an inner member, an outer member, and a brush portion; said inner member having a semi-spherical cap on the rear part thereof with an ink inlet being extended through a groove to the front point of a brush seat; and said outer member being a hollow cylinder mounted around said inner member, and one end of said outer member  
10 being retained on front end of a pen stem of said brush pen, while the other thereof being provided with at least more than one spacing strut to separate said outer member from said inner member so as to provide a passage for ink;

a pen stem including a stem member, a cap and a plug,  
15 and an upper end of said pen stem being provided with a slot vent (or a large vent and a small vent), and a stud located between said large vent and said small vent; and said plug being mounted in said upper end of said stem member, and said plug having an outer recess in communication with an ink  
20 reservoir of said pen stem; and said cap being mounted around said upper end of said pen stem; said cap and said plug being fixed together as one piece; and said cap having an inner recess on the inner surface thereof being opposite and corresponding to said outer recess of said plug, a left  
25 horizontal groove, a right horizontal groove and a

longitudinal groove; and a lower end of said pen stem having a hollow semi-spherical stud with an ink outlet; and joint parts between said stem member and said brush seat being furnished with salient code strips; and

5           a brush cap having a snap stud on the top surface thereof with a through cap vent; and a small cap being mounted on said snap stud, a through vent being provided on said small cap and being able to align or non-align with said cap vent upon said small cap being turned appropriately so as  
10       to have said brush cap closed or opened if necessary.

2. A fountain brush pen as claimed in claim 1, wherein said ink inlet is in communication with a nylon sponge and a pen tip made of fiber through a groove.           3. A fountain  
brush pen as claimed in claim 1, wherein the top end of said  
15       brush cap is mounted with a nylon sponge and a perform; and said nylon sponge being closely separated from the rest space of said brush cap by means of a partition board so as to isolate both ends of said brush cap.

20

**tents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number

9110439.8

**Relevant Technical fields**

(i) UK CI (Edition K ) A4K (KBA, KGC)

(ii) Int CI (Edition 5 ) A46B, B43K

**Databases (see over)**

(i) UK Patent Office

(ii)

**Search Examiner**

MRS C L DAVIES

**Date of Search**

16 August 1991

Documents considered relevant following a search in respect of claims

1-3

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

SF2(p)

Category	Identity of document and relevant passages	Relevant to claim(s)

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